

Industrial Developments

Human developments remove hundreds of thousands of acres of pronghorn habitat each year. Examples vary from new housing developments, through highway right-of-ways, to such hideous examples of needless excess as the International Airport outside of Denver. Recently, however, the most pervasive and large-scale threat to pronghorn habitat appears to be oil and gas development.

The greatest potential impacts from oil and gas development and production to pronghorn are through loss of habitat and displacement. Winter rangelands, seasonal movement corridors, and fawning areas require special management attention to reduce stress from oil and gas activities. To reduce stress on pronghorn in such crucial areas, land managers have used seasonal use restrictions to prohibit fluid mineral exploration and development activities. Such restrictions may be imposed by the public land manager under the terms of a federal oil and gas lease for the protection of wildlife. Although seasonal use varies with geographic area, definable fawning areas usually are occupied between 1 May and 31 July, and winter ranges are occupied between 15 November and 30 April. Depending upon severity of climatic conditions (i.e., snow depth, snow crusting, daily mean temperatures), the last 60 days of the winter range time limitation may be suspended by the authorizing officer.

New oil and gas wells often intrude into previously undisturbed, roadless areas, causing increased human activity as well as direct loss of habitat (Fig. 43). Most well locations require 2-5 acres (0.8-2.0 ha) of surface disturbance in addition to roads and other facilities. Areas where activity should be avoided include south-facing slopes and wind-blown ridges on pronghorn winter ranges. Another recommendation that would minimize impacts is to only allow oil and gas drilling activities during non-crucial seasons, allowing pronghorn to gradually become accustomed to these disturbances. Oil and gas drilling activities probably would be less disruptive if they were already in progress when pronghorn moved into an area, as opposed to initiating operations during the wintering period and displacing animals. The effects of disturbance may often extend beyond the drill pad boundary and cause pronghorn to move into adjacent areas, thereby increasing the use of sub-optimal habitats, conflicts with agriculture, and human confrontations.

Pronghorn reactions to roads usually vary in response to traffic volume. Primary effects of well-site access roads may come with associated fences and the resulting hindrance of pronghorn movements (Riddle and Oakley 1973).

Most geophysical exploration activities result in minimal surface disturbance over a short period, and it is concentrated human activity that causes increased stress or displaces animals from preferred habitats. Hence, the need for seasonal avoidance may vary on a site-specific basis, depending on local conditions.

Mineral conveyors transporting coal or oil more than 0.5 mile (0.8 km) across pronghorn rangelands should be mitigated by constructing earthen (hill-like) overpasses at 0.5 mile (0.8 km) intervals on high ground. Or, the conveyor may be raised 20-30 feet (6-9 m) above the ground level at strategic locations (Tessman 1985). During railroad construction, fence designs that impede big game migration/drift should be avoided. Fences in areas of significant pronghorn movements should be designed so that they can be temporarily let down to free entrapped animals when necessary.

Coal, oil, and gas field developments have impacted pronghorn habitat in several western provinces and states, and energy and mineral resource development and post-development land-use practices will continue to significantly alter western rangelands. Impacts of these developments will be compounding and cumulative. Therefore, in regions where the potential for extensive development exists, actions to protect and preserve pronghorn habitat should be planned, coordinated, and applied to the entire area of expected impact. The suggestions listed below are offered as guides to industry and to regulatory agencies for protecting pronghorn populations, for mitigating habitat destruction, and for reclaiming, rehabilitating, or enhancing pronghorn habitat on disturbed lands.



Figure 43. Gas well pipeline on Otero Mesa in southeast New Mexico. Increased travel and disturbance may be more detrimental to pronghorn than the presence of wells and pipelines themselves. Sierra Club photo by Jim Steitz

Overview - When and where applicable, local, state, provincial, and federal regulatory and management agencies should jointly develop regional priorities for areas that should and should not be developed to minimize the loss of ecologically important systems.

Lead Time - Specific industrial developments and related informational needs on pronghorn populations should be identified early enough to allow sufficient lead time for seasonal field work, budgeting, personnel assignments, and review by state or provincial wildlife management agencies and other interested parties.

Steering Committees - Steering committees, directed by the state or provincial wildlife management agency and composed of involved members of industry, federal, university, and interested citizen organizations or agencies, should be established as needed. Committees should be formed on a regional basis to provide guidance and advice for providing post-development land-use goals and to develop basic strategies for accomplishing them on each lease site.

Goals - Post-development land-use goals should include a commitment to maintain pronghorn, as an integral part of the development

plan for each lease, on both public and private lands that supported pronghorn prior to development.

Pre-development Surveys: Before initiating and completing an energy development plan, industry personnel should quantitatively identify, describe, and map the quality and extent of pronghorn distribution, movement patterns, and population characteristics; associated recreation and economic values; and baseline habitat/vegetative data for pronghorn. These parameters should be monitored throughout the life of the development. Study plans and progress should be directed and approved by the responsible state or provincial management agency.

Information on previous classifications of pronghorn herds in the general area of the project site should be compiled. Surveys need to be conducted to determine pronghorn production and population trends on and adjacent to the project site during both the pre-development and development phases.

Each population or herd's home range and movement patterns should be described and documented.

If available, obtain previous seasonal population estimates and index trends from reliable sources. Identify factors that affect populations such as habitat, weather, private landowner tolerance, hunting pressure, and harvest levels. Calculate the recreational value of pronghorn populations to be impacted, considering both non-consumptive and consumptive uses, land status adjacent to the project site, hunter and observer access, hunting quality, etc. Determine the economic value of the herd or an individual pronghorn

Identify unusual or excessive mortality, if any, from such causes as vehicles, severe weather, diseases, poaching, and predation.

Prepare qualitative and quantitative vegetative type maps of the affected areas prior to development. Prepare maps at 1:24,000, or at a similar scale, as a basis for reclamation goals and plans. Vegetation data should include a list of plant species, plant communities, height, and production. Quantitative data should include percent canopy cover, plant composition (grasses, forbs, shrubs), frequency, and expected annual production by major species.

Identify key species of plants important as pronghorn forage in relation to the seasons of the year that pronghorn are present. Based upon vegetative typing, delineate actual and potential pronghorn habitat within the development area.

All existing natural and man-made waters available to pronghorn should be depicted on maps. Quantitative data should be recorded for each water source, including gallons (liters) available during each season of the year and test results of water quality.

Monitoring: Specific areas identified as key to the maintenance and perpetuation of a pronghorn population, and which are difficult areas to duplicate, should receive top priority and, where possible, remain unaltered and available for use by pronghorn.

County land use planning for any ancillary or subsequent developments (housing, shopping centers, recreational facilities) should locate such developments away from critical pronghorn areas, particularly movement corridors.

An effort should be made to maintain existing public access and, where desirable, provide additional access to public lands while minimizing energy development access, operations roads, and associated fences. Those roads and railroads that are required should be located on the periphery of pronghorn use areas. Where this is not feasible, mitigation should be pursued.

Minimize the area for exploration and drilling and use techniques that create the least amount of activity and disturbance, and employ a unified, consolidated storage area for all energy development equipment and materials.

Restrict human activities to essential energy development-related efforts to prevent unnecessary disturbance to pronghorn. Prohibit or minimize disturbance of key areas and maintain a “no-entry” buffer zone of 0.25 mile (0.4 km) around all developments.

Enhancement: Restrict all impacting actions (post-development land use, emissions, discharges, effluents, etc.) to provide a subsequent level of pronghorn habitat that approximates or surpasses pre-development conditions. Strategies for achieving this (i.e., increased carrying capacity through range fertilization and/or enhancement, water development, purchase of private lands by public agencies) should be detailed in formal plans (i.e., energy development plans, species and habitat management plans, state comprehensive and operational plans).

Key areas lost during development should be mitigated by providing sites of equal value in adjacent or other areas and where displaced pronghorn can persist in similar or higher numbers than were present prior to development.

Reclamation plans should consider priorities for re-vegetation on the basis of nutritional and cover needs, and disturbed areas should be shaped into terrain that enhances pronghorn habitat and simulates natural conditions.

Water discharges and effluents resulting from any development should be made available for pronghorn and should meet or exceed suggested standards. Additional water sources should be developed as needed, e.g., drinking water ponds, springs, streams, guzzlers, etc., in all areas actually or potentially occupied by pronghorn.

Reclamation: Federal laws require restoration of public lands to natural conditions. Damaged and disturbed habitats should be restored and regenerated so that they approximate natural conditions. Reseeding mixtures should include native forbs and shrub species important to pronghorn (see Habitat Management). Domestic livestock and wildlife use on reclaimed areas should be postponed or regulated to promote an ecological succession that will enhance pronghorn populations. State or provincial wildlife management agencies should cooperate in regulating wildlife populations on reclaimed areas to ensure successful reclamation.

Reducing competition between pronghorn and domestic livestock on adjacent, non-developed lands can sometimes be used to mitigate habitat loss to development. When doing so, all environmental hazards and contaminants should also be removed from pronghorn rangelands, immediately after the cessation of development operations. These include all unused mining equipment, hardware, wire, pipe, barrels, toxic substances, etc., that might constitute a hazard to pronghorn. Oil field slush pits should be fenced with net-wire to prevent waste ingestion by pronghorn.

Post-development Objectives: Whenever possible, pronghorn losses due to development should be mitigated. Mitigation measures would include transplanting and restocking pronghorn when deemed necessary, desirable, and feasible by the state or provincial wildlife management agency. An even better mitigation solution is to purchase pronghorn habitats elsewhere or to purchase easements to "land-locked" public lands occupied by pronghorn (i.e., by use of mineral severance taxes or through lease stipulations, etc.).

Crop Depredations

Although pronghorn can generate considerable income to some landowners, they can also damage agricultural crops (Fig. 44). Such losses appear modest when viewed on a statewide or provincial basis, but can be important to the individual landowners affected. In nearly all cases, crop depredations are brought about by human-caused landscape changes. Examples include fences and sub-divisions that block movements, plowing summer or winter rangelands to grow crops, converting shrub-steppes to grass, prohibiting hunting, or charging too much for hunter access. Crop depredation complaints appear to be increasing, apparently because pronghorn numbers generally are increasing while traditional pronghorn habitat is being lost to "improved" pastures, grain fields, and human development. Results of a survey sent to conservation agencies in 18 western states and provinces in 1991 indicated that depredations were stable in 9 states and increasing in 8. Only in Nebraska were depredation complaints decreasing, apparently because pronghorn numbers in that state were depressed. Almost every agency reported some damage to alfalfa and wheat; a few others added soy beans, field peas, and fall rye to the list. Most state agencies did not pay compensation for crop damage; those that did paid a total of about \$85,000 in U. S. dollars in 1990 (O'Gara and Yoakum 2004).

Because of resistance to expanding pronghorn hunting seasons in California, translocations were used to reduce depredations to irrigated alfalfa fields. Translocations are only practical, however, if suitable habitat is available for the released animals. Apparently because of political pressure, the pronghorn were translocated into marginal habitat (McCarthy and Yoakum 1984), resulting in the eventual death or movement of remaining animals to adjacent, more favorable habitats in Nevada. Thus, translocations designed to save pronghorn from hunters' bullets resulted in a loss of both pronghorn and of funds that could have been better used to benefit animals elsewhere.

Other states, such as the Nevada Division of Wildlife, also have the option of holding depredation hunts (Tsukamoto 2003). Where depredation problems are expected, the Division plans a special depredation hunt in conjunction with the season setting process. Hunt applicants apply for these special hunts during the spring, and when a depredation complaint is received, a depredation hunt can be initiated within 2 weeks. Unsuccessful applicants in the regular hunt process for that hunt unit are also contacted and awarded tags if necessary. Such hunting seasons, staggered during the depredation period, alleviate much of the problem by removing and harassing the pronghorn involved.



Figure 44. Alfalfa crop depredation is one of the most prevalent agricultural damage cases attributed to pronghorn. However, it can at times serve management as was the case for this area in northern California where excess pronghorn were captured and translocated to other sites. Photo by Bob Schaffer.

The Nevada Legislature recently authorized the Division to develop procedures and regulations whereby big game tags can be allocated to landowners having depredation problems. Under this system, the landowner cannot use the tags, but can sell them. The number of tags a landowner is qualified for is based on the number of animals found on his/her property, and the ratio of tags to numbers of animals is to be negotiated.

The most practical method for solving crop depredation complaints appears to maintain a pronghorn population capable of living mostly on uncultivated rangelands through the issuance of sufficient numbers of doe/fawn permits during the regular hunting season. If problems persist, special permits issued for hunts in the affected fields, and at the time of depredation, may solve the problem. Early season depredation hunts should only be authorized for bucks, because fawns would be orphaned by shooting does. The same is true for translocation captures. Orphaning fawns would only result in their deaths during about two months of the year, however, usually June and July (Bromley and O'Gara 1967). Shooting bucks may do little to reduce pronghorn numbers in an area, but accompanying animals often stay away from fields after a few bucks are shot. In some cases, simply fencing a haystack will solve a problem.

Pronghorn Management Plans

With the growth of human populations and society's expanded use of the land, the need to document pronghorn' requirements for forage, water, and space has increased. Pronghorn have thrived during the past half- century, but the need exists to manage for

healthy populations and compatible human use. One way to meet these needs is by Management Plans that list the objectives, goals, and procedures to best manage the species by maintaining and/or improving forage, water, and space; and by coordinating pronghorn management into holistic land-use plans.

Wildlife Management Plans usually are initiated by state and provincial wildlife agencies. They emphasize practices to protect, reduce, maintain, or enhance populations. They typically spell out methods to inventory populations, alleviate limiting factors, and how to harvest or translocate surplus animals.

Habitat Management Plans are generally prepared by government or by private land agency personnel. Such plans emphasize the maintenance or improvement of forage, water, and space for pronghorn, and attempt to identify to what degree pronghorn are compatible or competitive with other land uses.



Figure 45. Crop depredation and loss of habitat are brought about by changes made by humans.
Photo by Bart O'Gara.

Management Plans (Recovery Plans) for endangered species are mandatory in accordance with the Endangered Species Act (1973). Such plans identify possible procedures to increase a species or sub-species to a level sufficient for de-listing.

The various guides suggesting techniques and practices to manage pronghorn and their habitat are aids to biologists developing Management Plans. To date, these include: *Wildlife Management Techniques Manual* (Ripley 1980); *Habitat Management Guides for the American Pronghorn Antelope* (Yoakum 1980); *Range/Wildlife Habitats in Managed Rangelands-The Great Basin of Southeastern Oregon: Pronghorn* (Kindschy et al. 1982); *Pronghorn Antelope Populations and Habitat Management in Northeastern*

Great Basin Environments (Salwasser 1980), *Programa para la conservación, manejo y aprovechamiento sustentable del berrendo* (*Antilocapra americana*) en México (Dirección General de Vida Silvestre 2000, Cancino et al. 2000), *The Peninsular Pronghorn Recovery Plan* (Cancino et al. 2004), and Final Pronghorn Management Plan F.E. Warren Air Force Base, Wyoming (Anonymous 2004). In addition, Yoakum (2004c.) provides a discussion and listing of Management Plans specific for pronghorn, their habitat, and enhancements for the recovery of imperiled populations.



Figure 46. When pronghorn are retained in enclosures for long periods of time (e.g., field research, holding for transplants, etc.), it is advisable to provide shade. Pronghorn readily use such facilities, especially in desert environments as pictured here for penned animals in Baja California Sur, Mexico. Photo by Jorge Cancino.